

REMARKS

Claims 47-65 have been presented to replace the previous claim set and more clearly distinguish over the cited art.

Entry of the above amendment is respectfully requested.

Art Rejections

On page 2 of the Office Action, in paragraph 2, claims 21, 23, 29-35 and 46 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 0055110 or equivalent US 6,733,690. Also, on page 6 of the Office Action, in paragraph 3, claims 1, 3-6, 12-20 and 36-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 0055110 or equivalent US 6,733,690.

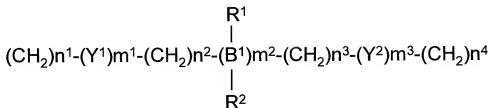
Applicants respectfully submit that the present claims are neither anticipated by nor obvious over the cited art, and request that the Examiner reconsider and withdraw these rejections in view of the following remarks.

Novelty of present invention over US 6,733,690

The present invention relates to a mixture comprising:

i) a cross-linkable liquid crystalline host comprising at least one cross-linkable liquid crystalline compound, and

ii) at least one chiral or achiral rod shaped additive of formula (I), wherein the additive comprises a side chain having an alkyl-ester-alkyl group such as $(CH_2)_n^1-(Y^1)m^1-(CH_2)_n^2$, wherein Y^1 is $-OCO-$ or $-COO-$, as shown below in formula (III):



Further, the present invention relates to a compound of formula (I), wherein the additive comprises a side chain having an alkyl-ester-alkyl group such as $(\text{CH}_2)_{n^1}-(\text{Y}^1)m^1-(\text{CH}_2)_{n^2}$, wherein Y^1 is $-\text{OCO}-$ or $-\text{COO}-$, as shown above in formula (III).

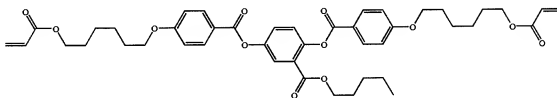
US 6,733,690 does not disclose a chiral or achiral compound having an alkyl-ester-alkyl group in its side chains.

In addition, Applicants note that all further claims, such as method and application claims, refer back to the mixture or compound of the invention.

Hence, Applicants submit that the present invention is novel over US 6,733,690.

Non-obviousness over the teaching of US 6,733,690

US 6,733,690 describes in Example 3 a liquid crystal compound of the following formula



This compound differs from the compound (I) of the present invention in that:

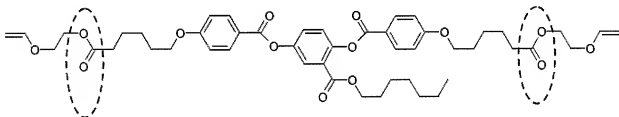
- this compound of US 6,733,690 is not chiral, and
- this compound does not comprise a side chain having an alkyl-ester-alkyl group such as a $(\text{CH}_2)_{n^1}-(\text{Y}^1)m^1-(\text{CH}_2)_{n^2}$ group, wherein Y^1 is $-\text{OCO}-$ or $-\text{COO}-$.

The compounds of the present invention differ not only in their chemical structure, but also by having different transition temperatures to the isotropic state:

a) Compound of US 6,733,690, Example 3 → transition temperature is 63°C;

whereas

b) Additive No. 8 of the present invention → transition temperature is 10°C:



Additive No. 8

Very astonishingly, these additives having such low transition temperature were found.

The present invention gives access to fine-tuned liquid crystalline mixtures by doping them with small amounts of these additives. Herewith the properties of liquid crystalline mixtures are optimized in their orientation potential: reduced time needed for orienting, without major changes to the physical properties of the whole mixture such as depression of the transition temperature, the clearing point, or a reduction of the thermal liquid crystalline range, etc.

Applicants submit that a skilled person would not have arrived at the present additives and liquid crystal mixtures using the teaching of US 6,733,690, because the compounds of US 6,733,690 all have high clearing points, such as the compound of Example 3 with 63°C.

It was much more surprisingly found in the present invention that with the novel additives the orientation property could be significantly accelerated (see Example 9 of the

present invention, on pages 57 to 60, wherein the orientation time of the doped mixture was 1 minute, whereas the not-doped mixture needed 15 minutes) and the aligning properties could be significantly enhanced as shown in Example 10 of the present invention.

This high orientation in only 1 minute was accessed by a novel mixture of the invention, wherein only 2% of the additive was present.

Applicants submit that this advantageous influence of low amounts of additives of the present invention to a liquid crystal mixture could not have been foreseen starting from the teaching of US 6,733,690.

Hence, Applicants submit that the present invention is non-obvious over the teaching of US 6,733,690.

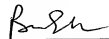
Thus, withdrawal of these rejections is respectfully requested.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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